Influenza A (H3N2) Variant Virus (also known as "H3N2v") - Key Points

August 9, 2012

In this document:

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- Influenza A (H3N2) viruses with genes from avian, swine and human viruses that normally circulate in swine can sometimes infect humans.
- When human infections with these viruses occur, these viruses are called "variant" viruses (which also can be denoted with the letter "v").
- When these viruses are found in swine, they are called swine influenza A (H3N2) viruses.
- In 2011, a new influenza A (H3N2v) virus was detected that had acquired the M gene from the influenza A(H1N1)pdm09 (2009 H1N1) virus.
- Sporadic human infections with this H3N2v virus have been detected (see Summary of Epidemiology).
- Most human infections have occurred following swine contact. While limited human-to-human transmission of H3N2v virus is thought to have occurred on three occasions in the fall and winter of 2011, sustained and efficient community transmission of H3N2v virus has not been detected to date.
- According to USDA swine influenza surveillance, this swine H3N2 virus with the pandemic M gene has been detected in swine in a number of U.S. states. This virus may be circulating widely in U.S. swine at this time.
- It is possible that acquisition of the 2009 H1N1 virus M gene may make H3N2 viruses in swine more transmissible to humans and possibly among humans.

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Situation Update

- Today CDC provided an update on the H3N2v situation in the United States and announced changes in H3N2v case reporting.
- For more information on the changes to H3N2v case reporting, please see the section of the key points entitled "Changes to reporting of H3N2v cases."
- As a result of the changes to reporting of H3N2v cases and because there have been additional specimens tested this week, CDC and several states with H3N2v cases are reporting a significant increase in the number of H3N2v cases this week compared with last week.
- Right now, a large number of agricultural fairs are ongoing around the country, and direct exposure of people to infected pigs has been the primary cause for infection, according to investigations conducted so far this year.
- There is no evidence of sustained human-to-human spread of this virus in the community at this time.
- CDC's seasonal influenza surveillance has not shown signs of an increase in influenza activity.
- This is not a pandemic situation, but CDC is continuing to monitor closely.
- The severity of human illness associated with this virus continues to resemble that of seasonal flu. Most cases have occurred in children, have been mild and self-limited, and have resolved on their own.
- It is likely, however, that further cases will be identified in the upcoming days.
- It also is possible that sporadic infections and even localized outbreaks among people with this virus may occur in other parts of the country, as this virus has been detected in swine in many U.S. states, according to USDA swine influenza surveillance.
- CDC has received reports of influenza-like-illness from other states and is working with state partners to investigate.
- Limited human-to-human transmission with this virus has been observed in the past, and we expect that some limited human to human spread may be observed in these current outbreaks.

- Ongoing investigations will determine whether or not there is human-to-human transmission in the current outbreaks, and if so, the extent of transmission.

- Again, although cases reported so far have been mostly mild, as with seasonal flu, severe illness resulting in hospitalization – and even death – is possible.

- Persons with underlying chronic conditions that place them at increased risk for severe seasonal influenza also are likely at higher risk for complications from H3N2v infection.

- Persons with suspected H3N2v virus infection who are at high risk for influenza complications, as well as hospitalized patients with suspected H3N2v, should be treated with antiviral drugs as soon as possible.

- H3N2v virus is sensitive (susceptible) to available prescription antiviral drugs oseltamivir and zanamivir.

Summary of Epidemiology of H3N2v Cases in 2012

- On August 9, CDC announced 129 new cases of H3N2v virus infection from three states: Indiana (108), Ohio (20) and Illinois (1).

- From July 12 through August 9, 2012, 145 confirmed cases of H3N2v virus infection were reported to CDC from the following four states: Hawaii (1), Illinois (1), Indiana (113) and Ohio (30). Of these 145 cases:
    - All 145 cases reported contact with swine prior to illness onset;
    - 144 reported contact while attending or exhibiting swine at an agricultural fair.
    - Two cases were hospitalized but have since recovered.

- CDC has prepared a table on its website that shows the total number of H3N2v cases reported by state in 2011and 2012 (the total for both years combined is now 158). This table will be updated each Friday in conjunction with the FluView report and is available online at http://www.cdc.gov/flu/swineflu/influenza-variant-viruses-h3n2v.htm.

What Could Happen? (More Cases May Occur, Some Severe)

- More cases of human infection with H3N2v virus are anticipated, occurring either from exposure to infected swine or through subsequent, limited human-to-human transmission.

- Limited serologic studies conducted to date indicate that children would have little to no pre-existing immunity to this new virus (whereas adults may have some pre-existing immunity). Therefore, cases are more likely to occur in children.

- Also, as with seasonal influenza, certain people are likely at greater risk of serious influenza-related complications.

- As a result, cases of severe illness and death resulting from infection with this virus could occur among children and other people, especially those with high risk conditions like asthma, diabetes, heart disease or women who are pregnant.

- It also is possible that this H3N2v virus could gain increased capacity for efficient and sustained human-to-human transmission because influenza viruses are constantly evolving.

Changes to reporting of H3N2v cases

- On August 6, CDC in conjunction with the Association for Public Health Laboratories (APHL), provided guidance to state laboratories that allowed states to confirm their own H3N2v cases prior to laboratory confirmation at CDC.

- Previously, respiratory specimens were collected from patients and were sent to the state health department laboratories for testing. Once the state laboratories got preliminary results consistent with suspect H3N2v cases (i.e., specimens from humans infected with H3N2v were positive for InfA, H3 and pdmInfA markers AND negative for H1 and pdmH1 markers), they then forwarded the samples to CDC for official confirmation. Once samples arrived at CDC, they were confirmed by genetic sequencing.

- Because all suspect H3N2v cases that were identified through preliminary laboratory testing at the state level were confirmed at CDC, the CDC worked with the FDA to update the CDC Flu rRT-PCR Dx Panel results interpretation to state that specimens with InfA, H3, and pdmInfA positive and H1 and pdmH1 negative results were "presumptive positive for influenza A(H3N2) variant virus."

- Because of the results interpretation update, CDC felt it was appropriate for the states to begin reporting their "presumptive positives" as "confirmed cases." State samples will still be forwarded to CDC where they will be confirmed, but this change in reporting will likely provide a more real-time indication of how these outbreaks are evolving in states.

- CDC anticipates that most – if not all – presumptive positive reports by the states will be confirmed at CDC.
- CDC will continue to update confirmed H3N2v in FluView and on its H3N2v website: http://www.cdc.gov/flu/swineflu/influenza-variant-viruses-h3n2v.htm.
- For now, CDC will update its case counts every Friday, based on information provided by the states.
- This means that except for Fridays, states will have the most up-to-date case counts and will provide them at their discretion.
- This Friday, a CDC Morbidity and Mortality Weekly Report (MMWR) will detail these changes to reporting of H3N2v cases.

CDC Information/Recommendations, including Treatment

- In response to recent human cases of H3N2v virus infection, CDC would like to convey the following information:

  (1) CDC recommends annual seasonal influenza vaccination for all persons aged 6 months and older to protect against seasonal influenza viruses; however, seasonal influenza vaccine is unlikely to protect against variant influenza viruses, including H3N2v viruses.

  (2) Studies conducted by CDC have indicated that children younger than 10 years old would have little to no immunity against H3N2v virus, whereas adults may have some cross-protective immunity. Most cases of H3N2v have occurred in children at this time.

  (3) There are two FDA–approved prescription antiviral drugs that are expected to be effective in treating illness associated with H3N2v. The antiviral drugs oseltamivir (Tamiflu) and zanamivir (Relenza) – which are used to treat infection with seasonal influenza viruses –are also expected to be effective in treating H3N2v virus infection. Early initiation of antiviral treatment is most effective. (For more information about influenza antiviral medications, please see www.cdc.gov/flu/antivirals/whatyoushould.htm.)

  (4) Influenza variant viruses have not been shown to be transmissible to people through eating or proper handling of pork (pig meat) or other products derived from pigs. For more information about the proper handling and preparation of pork, visit the USDA website fact sheet "Fresh Pork from Farm to Table."

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CDC Recommendations for the Public

At this time, CDC recommends the following:

- If you go to a doctor for flu symptoms (see below) following direct or close contact with swine, tell your doctor about this exposure.
- If you have flu symptoms, follow **CDC's regular recommendations for seeking treatment for influenza.**

    a. If you have symptoms of flu and are very sick or worried about your illness contact your health care provider.

    b. Certain people are at greater risk of serious flu-related complications (including young children, elderly persons, pregnant women and people with certain long-term medical conditions) and this is true both for seasonal flu and novel flu virus infections. (For a full list of people at higher risk of flu related complications, see www.cdc.gov/flu/about/disease/high_risk.htm.)

        - If these people develop ILI, it's best for them to contact their doctor as soon as possible. (The majority of recent H3N2v cases have been in children.)

    c. Your doctor may prescribe antiviral drugs that can treat the flu, including H3N2v. These drugs work better for treatment the sooner they are started. If you are prescribed antiviral drugs by your doctor, you should finish all of the medication, according to your doctor's instructions.

- Also, whenever you have flu symptoms and are seeing a health care provider, always remember to tell them if you have asthma, diabetes, heart disease, neurological and neurodevelopmental conditions, are pregnant, or are older than 65 or younger than 5 years. These conditions and age factors put you at high risk of serious complications if you have the flu.
- Flu signs and symptoms usually include fever and respiratory symptoms, such as cough and runny nose, and possibly other symptoms, such as body aches, nausea, vomiting, or diarrhea.
- Health care providers will determine whether influenza testing and possible treatment are needed.
- There are antiviral drugs that can be used to treat H3N2v as well as seasonal influenza. More information about influenza antiviral drugs is available at Treatment (Antiviral Drugs).

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Information for People Attending Fairs

- Thousands of fairs take place across the United States each year. Swine exhibits are common at these fairs.
- Of the H3N2v cases reported since July 2012 to date, 15 of 16 have been associated with attendance at fairs where swine were present. In some cases, patients reported direct contact with swine, in other cases they did not.
- CDC would like to let people know about preventive actions they can take to make their fair experience a safe and healthy one.
- The National Association of State Public Health Veterinarians has developed the "Compendium of Measures to Prevent Disease Associated with Animals in Public Settings, 2011," available online at http://nasphv.org/documentsCompendiumAnimals.html, to provide some preventive actions that are applicable to people raising animals, showing animals at fairs, or attending fairs including swine.

- **Take Action to Prevent the Spread of Flu Viruses Between People and Pigs**
    - Wash your hands frequently with soap and running water before and after exposure to animals.
    - Never eat, drink or put things in your mouth while in animal areas and don't take food or drink into animal areas.
    - Children younger than 5 years, people 65 years and older, pregnant women, and people with certain chronic medical conditions (like asthma, diabetes, heart disease, weakened immune systems, and neurological or neurodevelopmental conditions) are at high risk from serious complications if they get influenza. **These people should consider avoiding exposure to pigs and swine barns this summer, especially if sick pigs have been identified**.
    - If you have animals – including swine – watch them for signs of illness and call a veterinarian if you suspect they might be sick.
    - Avoid close contact with animals that look or act ill, when possible.
    - Avoid contact with pigs if you are experiencing flu-like symptoms.
    - If you must come in contact with pigs while you are sick, or if you must come in contact with pigs known or suspected to be infected, or their environment, you should use appropriate protective measures (for example, wear protective clothing, gloves, masks that cover your

mouth and nose, and other personal protective equipment) and practice good respiratory and hand hygiene.

Signage for Posting at Fairs and Other Places Animals are Exhibited

- The "Compendium of Measures to Prevent Disease Associated with Animals in Public Settings, 2011" states that education is essential to reduce risks associated with animal contact in public settings and claims that experience from outbreaks suggests that visitors knowledgeable about potential risks are less likely to become ill. The Compendium offers the following recommendations to venue operators regarding signage and hand washing recommendations:

- Venue operators should:
  - Maintain hand-washing stations that are accessible to children, and direct visitors to wash their hands when exiting animal areas.
  - Position hand-washing stations in places that encourage hand washing when exiting animal areas.
  - Provide visitors with educational messages before they enter the exhibition areas, including information that animals can cause injuries or carry organisms that can cause serious illness.
  - Provide information in a simple and easy-to-understand format that is age- and language-appropriate.
  - Provide information in multiple formats (e.g., signs, stickers, handouts,).

- The Compendium provides posters for use around animal exhibits that describe actions people can take to minimize disease and injury risks. These materials include:

  - Safety at Animal Exhibits Poster (http://nasphv.org/Documents/AnimalExhibitsSafety.pdf)
  - Animal Exhibits Handwashing Poster (http://nasphv.org/documentsCompendiumAnimals.html)
  - Animal Exhibits Handwashing Poster (Spanish) (http://nasphv.org/Documents/HandwashingPosterSpanish.pdf)

- Several state agencies have made additional signage publicly available:
  - The North Carolina Department of Agriculture & Consumer Services has animal exhibit signage publicly available on its website at http://www.ncagr.gov/markets/fairs/fairmanagerinfo.htm#resources.
  - The Colorado Department of Public Health and Environment has animal exhibit signage publicly available on its website at

(http://www.cdphe.state.co.us/dc/Epidemiology/dc_group.html) under the "Animals in Public Settings" heading.

CDC Guidance Documents

- Guidance documents related to variant influenza viruses, such as H3N2v are posted at http://www.cdc.gov/flu/swineflu/influenza-variant-viruses.htm.
- These guidance documents are:
  - "Interim Guidance on Case Definitions to be Used for Investigations of Influenza A (H3N2) Variant Virus Cases" for state and local health departments is available at http://www.cdc.gov/flu/swineflu/case-definitions.htm.
  - "Prevention Strategies for Seasonal and Influenza A(H3N2)v in Health Care Settings" is available at http://www.cdc.gov/flu/swineflu/prevention-strategies.htm.
  - "Interim Guidance on Specimen Collection, Processing and Testing for Patients with Suspected Influenza A (H3N2) Variant Virus Infection" for public health professionals is available at http://www.cdc.gov/flu/swineflu/h3n2v-testing.htm, and
  - "Interim Guidance for Influenza Surveillance: Additional Specimen Collection for Detection of Influenza A (H3N2) Variant Virus Infections" for state and local health departments is available at http://www.cdc.gov/flu/swineflu/h3n2v-surveillance.htm.